

(No Model.)

W. G. HOWELL.

PILE OF COMBINED IRON AND STEEL.

No. 281,366.

Patented July 17, 1883.

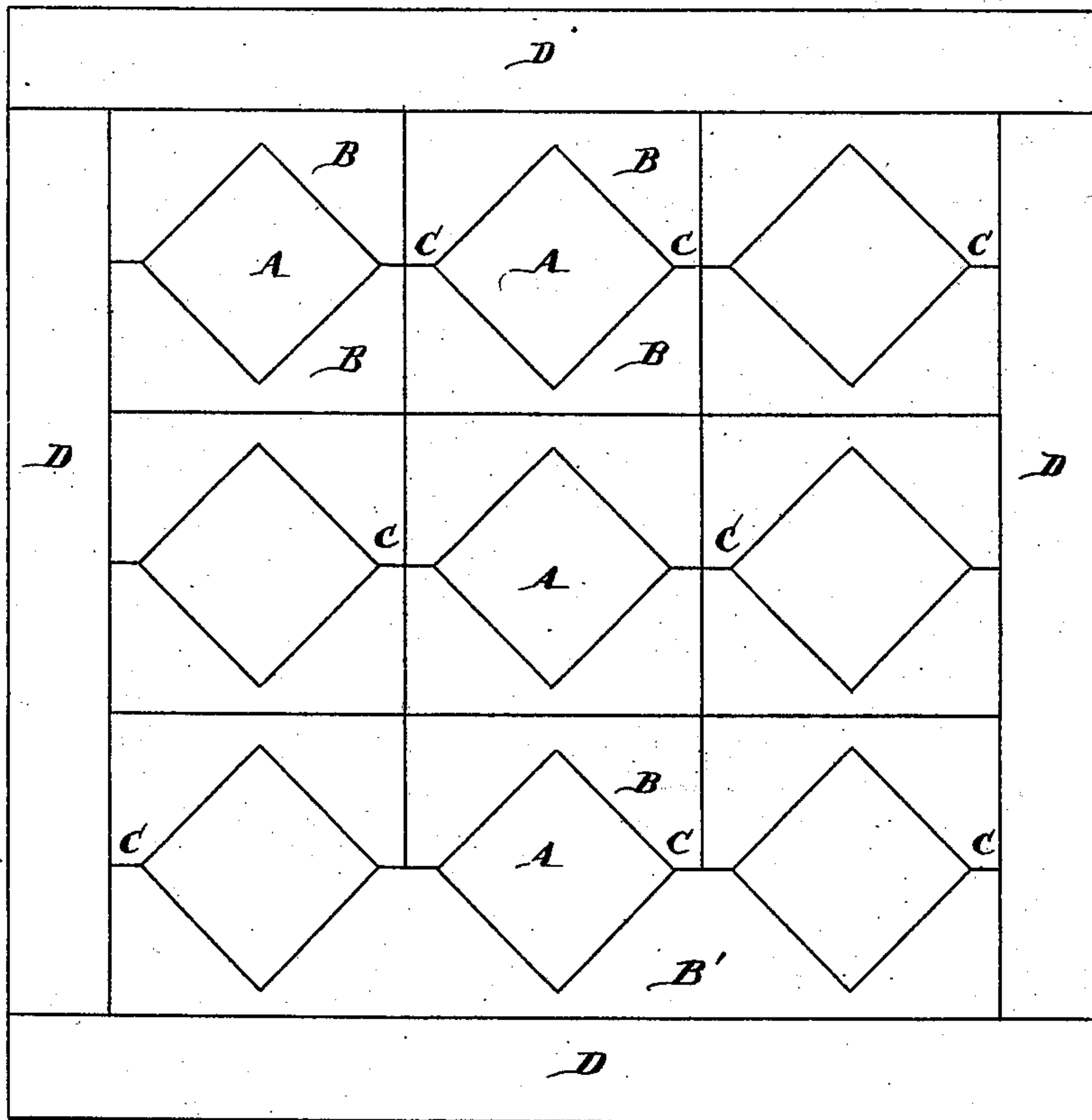


Fig. 1

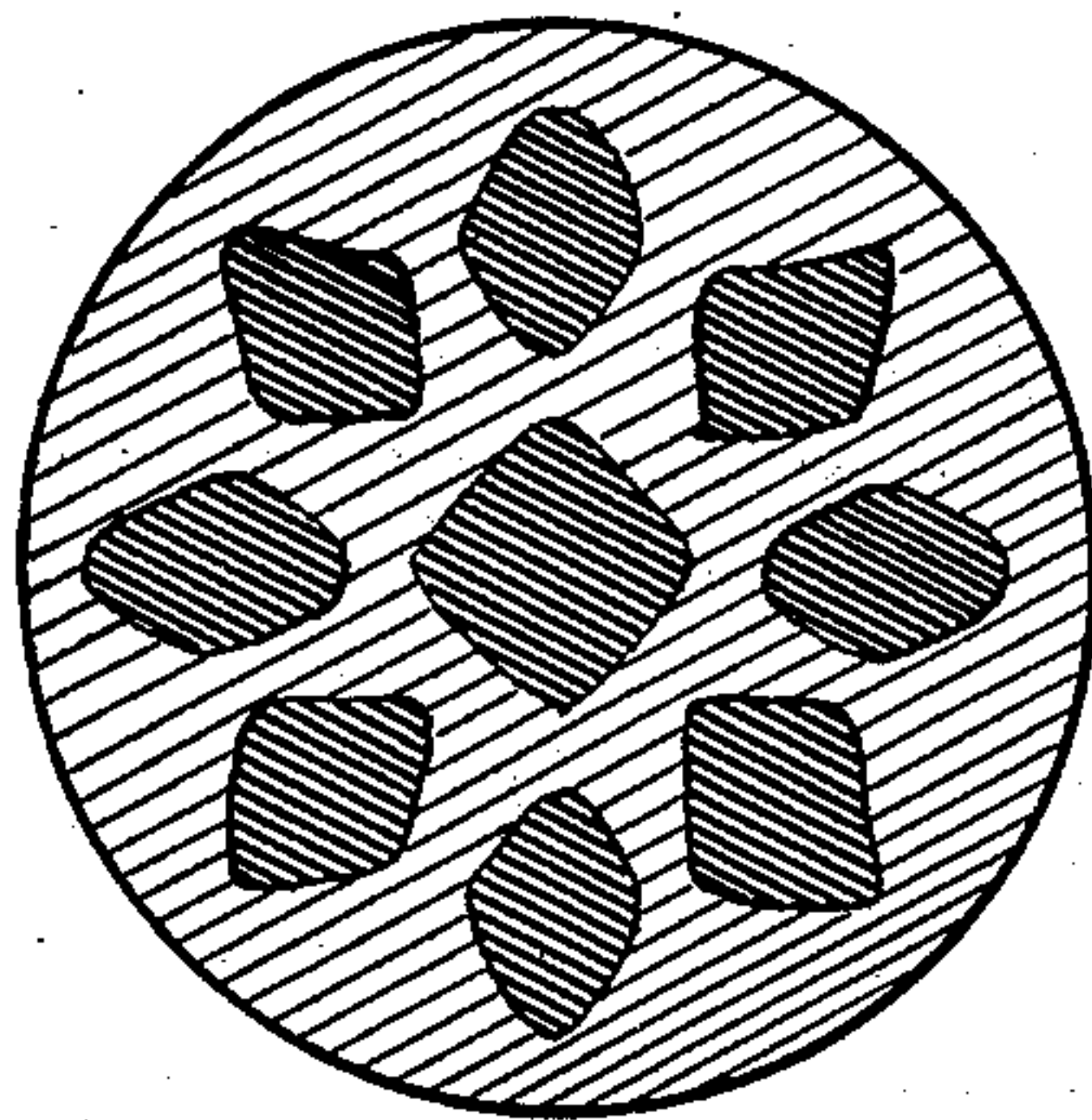


Fig. 2

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UNITED STATES PATENT OFFICE.

WILLIAM G. HOWELL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF
ONE-HALF TO WILLIAM GERHARD, OF SAME PLACE.

PILE OF COMBINED IRON AND STEEL.

SPECIFICATION forming part of Letters Patent No. 281,366, dated July 17, 1883.

Application filed January 13, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM G. HOWELL, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Piles of Combined Iron and Steel for the Manufacture of Axles, Shafts, &c., of which the following is a specification.

My invention has reference to piles of combined iron and steel; and it consists in forming the pile of a series of steel central bars surrounded by iron shaped to form an envelope, as more fully set forth in the following specification, and shown in the accompanying drawings, which form part thereof.

Heretofore combined iron and steel piles from which to roll axles, shafts, &c., were made with single steel centers enveloped in an iron covering.

The object of my invention is to so form the pile that when rolled the steel and iron will be firmly welded together, the steel being in a series of bars running longitudinally through the solid mass of iron, whereby the strength is greatly improved, owing, mainly, to the fact that a flaw in any one of the steel bars or centers will not materially weaken the combined bar, as would be the case if there were but one steel center, as constructed heretofore.

In the drawings, Figure 1 shows a cross-section of my improved pile, and Fig. 2 is a cross-section of a combined iron and steel axle or shaft made from said pile.

A represents steel bars substantially square or diamond-shaped in cross-section, which are inclosed within arched U or V shaped bars B, of wrought-iron or puddle bar, which bars meet at C on two opposite edges of the steel billets or bars A, as shown. If desired, a series of these bars B may be rolled together, as shown at B', and then placed together, inclosing the steel bars and keeping them separated.

This pile is then inclosed in the exterior flat bars of iron, preferably of puddle-bar, and the whole is bound together. It is then heated to a welding temperature and passed through the rolls, being rolled into railroad axles or shafting in which there are a series of longitudinal steel centers welded to the inclosing-envelope of iron, as shown in Fig. 2.

I do not limit myself to the exact shape of the pile described or to the double coating of iron or puddle bar; but I prefer that construction of combined iron and steel pile when used for the purpose specified.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The herein-described pile of combined iron and steel from which to roll axles, shafting, &c., which consists of a series of steel bars isolated from each other, inclosed and entirely enveloped by wrought-iron bars or puddle-bars, substantially as specified.

2. The herein-described pile of combined iron and steel from which to roll axles, shafts, &c., which consists of a series of steel bars isolated from each other, inclosed and entirely enveloped by iron bars, and the compound pile thus formed inclosed by external plates of iron, substantially as and for the purpose specified.

3. The herein-described shaft or axle, which consists of iron having a series of longitudinal steel centers, said centers being separated from each other by the interposed iron, substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

WILLIAM G. HOWELL.

Witnesses:

WM. GERHARD,
W. HOPKINS.